

Table 1: **Measurement Techniques in Solar and Space Physics Block Schedule**

	Mon, April 20			Tue, April 21			Wed, April 22			Thur, April 23			Fri, April 24
8:30 - 10:15	<div>[1] Plenary: Agency / Decadal [Auditorium] Baker, Newmark, Jorgensen</div>			<div>[6] Plenary: Particles (#1) [Auditorium] Zurbuchen, McFadden, Funsten</div>			<div>[10] Plenary: Fields (#2) [Auditorium] Strangeway, Bale, Ergun</div>			<div>[14] Plenary: Ground (#2) [Auditorium] Lin, Gary, Semeter</div>			<div>[18] Plenary: Tech Integration / Future Directions (#1) [Auditorium] Burch, Heelis, Schwadron</div>
	Break			Break			Break			Break			Break
10:30 - 12:15	<div>[2] Plenary: Photons (#1) [Auditorium] Cirtain, Holman</div>			<div>[7] Plenary: Ground (#1) [Auditorium] Donovan, Mann, Nicolls</div>			<div>[11] Plenary: Photons (#2) [Auditorium] Mende, Paxton</div>			<div>[15] Plenary: Particles (#2) [Auditorium] Moebius, Knudsen, Larsen</div>			<div>[19] Plenary: Tech Integration / Future Directions (#2) [Auditorium] Cheung, Davila, Foster</div>
	Lunch			Lunch			Lunch			Lunch			Lunch
13:15 - 15:00	<div>[3] Plenary: Fields (#1) [Auditorium] Mozer, Luhr, Torbert</div>			<div>[8.a] Photons: [North] Imaging</div>	<div>[8.b] Particles: [Center] Measuring Plasmas</div>	<div>[8.c] Fields: [South] Plasma Waves & Space- Based Instruments w/EM Waves</div>	<div>[12.a] Ground: [North] Solar</div>	<div>[12.b] Particles: [Center] Energetic Neutral Atoms (ENA)</div>	<div>[12.c] Fields: [South] DC Electric</div>	<div>[16.a] Photons: [North] Algorithms & Techniques</div>	<div>[16.b] Particles: [Center] Thermal / Core Plasmas</div>	<div>[16.c] Ground: [South] Radio 2 & Optical 2</div>	<div>[20] Editorial Meeting: [Center] Editorial Board (conveners)</div>
	Break			Break			Break			Break			
15:15 - 17:00	<div>[4.a] Ground: [North] Magnetometers / VLF / Optical</div>	<div>[4.b] Particles: [Center] Composition</div>	<div>[4.c] Photons: [South] Spectroscopy</div>	<div>[9.a] Photons: [North] Imaging</div>	<div>[9.b] Particles: [Center] Tomorrow's Instruments</div>	<div>[9.c] Ground: [South] Optical 1</div>	<div>[13.a] Ground: [North] Arrays</div>	<div>[13.b] Particles: [Center] Energetic</div>	<div>[13.c] Photons: [South] Detectors *ends at 17:30*</div>	<div>[17.a] Photons: [North] Misc</div>	<div>[17.b] Particles: [Center] New Techniques</div>	<div>[17.c] Fields: [South] Spacecraft Charging</div>	
	Break			Break			Break			Break			
17:15 - 19:00	<div>[5.a] Ground: [North] Radio 1</div>	<div>[5.b] Particles: [Center] Neutral Gas</div>	<div>[5.c] Fields: [South] DC Magnetic</div>	<div>[21.a] Particles Posters</div>	<div>[21] POSTERS ↔ [Lobby]</div>	<div>[21.b] Photons Posters</div>	<div>Networking Mixer Time: 17:30 - 19:00 Location: NCAR Mesa Lab [No shuttle]</div>			<div>[22.a] Ground Posters</div>	<div>[22] POSTERS ↔ [Lobby]</div>	<div>[22.b] Fields Posters</div>	
				*** Science Instrument Hosted Payload Workshop, 18:30 - 19:30 [Center]									

Monday, April 20, 8:30 - 19:00

1 8:30 - 10:15: PLENARY – Agency / Decadal [Auditorium]

Chair(s): J. Spann

- 1.1 8:30 - 8:45: Jim Spann & Thomas Moore: Introduction to MTSSP
- 1.2 8:45 - 9:15, Invited: Dan Baker: Measurement Technology Challenges: The 2013-2022 Decadal Survey in Solar and Space Physics
- 1.3 9:15 - 9:45, Invited: Jeffrey Newmark: NASA Technology Development Programs
- 1.4 9:45 - 10:15, Invited: Therese Moretto Jorgensen: Measurement Technology Challenges: the NSF Geospace Perspective

2 10:30 - 12:15: PLENARY – Photons (#1) [Auditorium]

Chair(s): S. Christe

- 2.1 10:30 - 11:30, Invited: Jonathan Cirtain: Perspectives on the next generation in space-based solar remote sensing
- 2.2 11:30 - 12:15, Invited: Gordon Holman: Scientific Considerations for Future Spectroscopic Measurements of Activity on the Sun from Space

3 13:15 - 15:00: PLENARY – Fields (#1) [Auditorium]

Chair(s): R. Pfaff & B. Anderson

- 3.1 13:15 - 13:50, Invited: Forrest Mozer: How to measure DC electric fields
- 3.2 13:50 - 14:25, Invited: Hermann Lühr: Recent Progress in DC Magnetic Field Measurement and Analysis
- 3.3 14:25 - 15:00, Invited: Roy Torbert: Electromagnetic Field Measurements in Rarified Plasmas using the Electron Drift Instrument.

4 15:15 - 17:00: PARALLEL SESSIONS – Ground, Particles, Photons

4.a Ground – Magnetometers / VLF / Optical [North]

Chair(s): I. Mann

- 4.a.1 17:15 - 17:35, **Invited:** Marc Lessard: Recent Advances in Fluxgate Magnetometer Developments
- 4.a.2 17:35 - 17:55, **Invited:** Robert Moore: Ground-based ELF/VLF observations in Antarctica
- 4.a.3 17:55 - 18:08: János Lichtenberger: Ground based Very Low Frequency Measuring Networks
- 4.a.4 18:08 - 18:21: Eftyhia Zesta: The dynamics of the plasmasphere and its boundary layer remotely determined by ground magnetometers
- 4.a.5 18:21 - 18:34: Endawoke Yizengaw: The ULF Wave Related Fluctuation of Equatorial Electrodynamics and Its Longitudinal Variability
- 4.a.6 18:34 - 18:47: Asti Bhatt: A network of ground-based red-line optical imagers in continental United States: Initial data and future plans
- 4.a.7 18:47 - 19:00: Emma Spanswick: The Redline Emission Geospace Observatory (REGO) all-sky imaging array - system design and initial results

4.b Particles – Composition [Center]

Chair(s): G. Earle, J. Clemmons

- 4.b.1 15:15 - 15:35, **Invited:** Stefano Livi: Gas Composition Analyzers
- 4.b.2 15:35 - 15:55, **Invited:** Dominique Delcourt: The Mass Spectrum Analyzer (MSA) onboard Bepi Colombo MMO
- 4.b.3 15:55 - 16:08: Mihir Desai: Compact Dual Ion Composition Experiment for Space Plasmas —CoDICE
- 4.b.4 16:08 - 16:21: M.E. Hill: The Mushroom: A Half-Sky Time-of-Flight Mass Spectrometer for Energetic Ion and Electron Detection
- 4.b.5 16:21 - 16:34: Jason Gilbert: The Pickup Ion Composition Spectrometer
- 4.b.6 16:34 - 16:47: Elizabeth MacDonald: Recent advances in plasma mass spectrometry
- 4.b.7 16:47 - 17:00: Thomas Moore: Obtaining a 3D View of Ionospheric Pick-Up Ions

4.c Photons – Spectroscopy [South]

Chair(s): S. Bandler

- 4.c.1 15:30 - 16:00: Leonard Strachan: Remote Sensing of Coronal Suprathermal Seed Particles involved in Solar Energetic Particle Acceleration
- 4.c.2 15:15 - 15:30: Simon Bandler: X-ray microcalorimeters for solar physics
- 4.c.3 16:00 - 16:15: Kenneth Dymond: The High Resolution Ionospheric and Thermospheric Spectrograph (HITS) on the Advanced Research and Global Observing Satellite (ARGOS)
- 4.c.4 16:15 - 16:30: Kenneth Dymond: The Ionospheric Spectroscopy And Atmospheric Chemistry (ISAAC) Experiment on the Advanced Research and Global Observing Satellite (ARGOS)
- 4.c.5 16:30 - 16:45: Rick Doe: Narrowband Nanosatellite-Scale Photometry for VUV Astronomy
- 4.c.6 16:45 - 17:00: Christoph Englert: MIGHTI: Interferometers for the observation of thermospheric neutral wind and temperature on board the ICON satellite mission

5 17:15 - 19:00: PARALLEL SESSIONS – Ground, Particles, Fields

5.a Ground – Radio 1 [North]

Chair(s): J. M. Ruohoniemi

- 5.a.1 15:15 - 15:35, **Invited:** Ivan Galkin: Global Monitoring of Bottomside Ionospheric Plasma with GIRO Sensors
- 5.a.2 15:35 - 15:55, **Invited:** Juha Vierinen: Small form factor ionosonde for ionospheric radio remote sensing
- 5.a.3 15:55 - 16:08: Cody Vaudrin: Multistatic Meteor Wind Radar and Results from a Recent Observation Campaign in Adelaide, Australia
- 5.a.4 16:08 - 16:21: Stephen Kaeppler: Ionospheric Imaging Using Incoherent Scatter Radar and Ground-Based Optical Imagers
- 5.a.5 16:21 - 16:34: John Swoboda: Three-dimensional ionospheric reconstruction using electronically steerable ISR
- 5.a.6 16:34 - 16:47: Philip Erickson: Next Generation Incoherent Scatter Radar: Science and Technology
- 5.a.7 16:47 - 17:00: J Michael Ruohoniemi: Advances in ground-based observations of the magnetosphere, ionosphere, and upper atmosphere with the SuperDARN HF radar technique

5.b Particles – Neutral Gas [Center]

Chair(s): D. Delcourt

- 5.b.1 17:15 - 17:35, **Invited:** Gregory Earle: Neutral Pressure and Wind Measurement Technologies to Address Thermospheric Science Objectives
- 5.b.2 17:35 - 17:55, **Invited:** James Clemmons: Techniques and instrumentation for *in-situ* measurements of the upper atmosphere
- 5.b.3 17:55 - 18:08: Stefano Livi: Strofio: A Novel Neutral Mass Spectrograph for Sampling Mercury's Exosphere
- 5.b.4 18:08 - 18:21: Andrew Nicholas: RAMS: A Miniature Ram Angle and Magnetic Field Sensor
- 5.b.5 18:21 - 18:34: Steven Watchorn: Development of the Nanosat O2 A-band Spatial Heterodyne Interferometer (NOASHIN)
- 5.b.6 18:34 - 18:47: Xinzhaoh Chu: Geospace and Atmosphere Observatory at Arrival Heights for Studies of Space-Atmosphere Interaction Region with Optical and Radio Remote Sensing in Antarctica
- 5.b.7 18:47 - 19:00: Marcin Pilinski: A Neutral Gas Concentrator on the Mass Analyzer for Real-time Investigation of Neutrals at Europa

5.c Fields – DC Magnetic Fields [South]

Chair(s): N Murphy, H. Korth

- 5.c.1 17:15 - 17:35, **Invited:** Neil Murphy: Techniques for absolute measurement of magnetic fields from spacecraft
- 5.c.2 17:35 - 17:50: Haje Korth: Miniature absolute scalar magnetometer based on the rubidium isotope ^{87}Rb
- 5.c.3 17:50 - 18:05: Andreas Pollinger: Key parameters of the Coupled Dark State Magnetometer
- 5.c.4 18:05 - 18:20: David Miles: Towards a Next Generation Fluxgate Magnetometer
- 5.c.5 18:20 - 18:35: Barry Narod: Advances in Permalloy cores for fluxgate magnetometers
- 5.c.6 18:35 - 18:55, **Invited:** Brian Anderson: Approaches to Spacecraft Magnetism Cleanliness in Support of Space Magnetic Field Measurements
- 18:55 - 19:00: Discussion

Tuesday, April 21, 8:30 - 19:00

6 8:30 - 10:15: PLENARY – Particles (#1) [Auditorium]

Chair(s): E. MacDonald, S. Jones

- 6.1 8:30 - 9:05, Invited: Thomas H. Zurbuchen: Innovations in Plasma Analyzers
- 6.2 9:05 - 9:40, Invited: James McFadden: Technology Challenges for Space Plasma Measurements
- 6.3 9:40 - 10:15, Invited: Herbert Funsten: Particle Measurements in Challenging Environments

7 10:30 - 12:15: PLENARY – Ground (#1) [Auditorium]

Chair(s): P. Erickson

- 7.1 10:30 - 11:15, Invited: Eric Donovan: Ground-Based Geospace Observations - Taking it to the Next Level
- 7.2 11:15 - 11:45, Invited: Ian Mann: Geospace Science from Ground-based Magnetometer Arrays: Advances in Sensors, Data Collection, and Data Integration
- 7.3 11:45 - 12:15, Invited: Mike Nicolls: Ground-based radar and radio techniques for Geospace observations

8 13:15 - 15:00: PARALLEL SESSIONS – Photons, Particles, Fields

8.a Photons – Imaging [North]

Chair(s): S. Mende

- 8.a.1 13:15 - 13:45: Brian Ramsey: Developments in X-Ray Optics
- 8.a.2 13:45 - 14:00: Brian Walsh: Wide field-of-view soft x-ray imaging for solar wind-planetary interactions
- 8.a.3 14:00 - 14:15: Daniel Seaton: Lessons Learned in Five Years of Observations with the EUV Solar Telescope SWAP onboard PROBA2
- 8.a.4 14:15 - 14:30: Douglas Rabin: The Next Generation of Coronagraphs: Smaller, Tailored, Distributed
- 8.a.5 14:30 - 15:00: Joseph Davila: Milli-Arcsecond Diffractive Imaging of the Sun in the Extreme Ultraviolet

8.b Particles – Measuring Plasmas [Center]

Chair(s): B. Lavraud, A. Jaynes

- 8.b.1 13:15 - 13:35, **Invited:** Andrei Fedorov: Plasma Imaging Optics
- 8.b.2 13:35 - 13:55, **Invited:** Yoshifumi Saito: Low Energy Charged Particle Spectrometers for High Time Resolution Measurements
- 8.b.3 13:55 - 14:08: Glyn Collinson: Calculating the geometric factor of electrostatic analyzers
- 8.b.4 14:08 - 14:21: Andrew Yau: Imaging Thermal Plasma Composition and Velocity Distributions *in-situ* Using Hemispherical Electrostatic and Time-of-Flight Analysis
- 8.b.5 14:21 - 14:34: John Podesta: Errors in the calculation of plasma bulk velocity from the phase space distribution
- 8.b.6 14:34 - 14:47: Levon Avanov: Study of Static Microchannel Plate Saturation Effects for the Fast Plasma Investigation Dual Electron Spectrometers on NASA's Magnetospheric MultiScale Mission
- 8.b.7 14:47 - 15:00: Earl Scime: Low voltage, ultra-compact plasma spectrometer

8.c Fields – Plasma Waves and Space-based Instruments Using EM Waves [South]

Chair(s): C. Swenson, C. Kletzing

- 8.c.1 13:15 - 13:35, **Invited:** James LaBelle: High Frequency Wave Measurements in Space Plasmas
- 8.c.2 13:35 - 13:55, **Invited:** Craig Kletzing: A Wave-Particle Correlator with Good Phase Resolution
- 8.c.3 13:55 - 14:15, **Invited:** Attila Komjathy: Space-Borne GNSS (GPS) Receivers and Related New Technologies For Space Physics Measurements and Natural Hazards Monitoring
- 8.c.4 14:15 - 14:35, **Invited:** Charles Swenson: Impedance Probe Measurements in the Ionosphere
- 8.c.5 14:35 - 14:55, **Invited:** Ivan Galkin: Active Space-borne Radio Sensing of Ionosphere and Magnetosphere
- 14:55 - 15:00: Discussion

9 15:15 - 17:00: PARALLEL SESSIONS – Photons, Particles, Ground**9.a Photons – Imaging [North]***Chair(s): D. Rabin*

- 9.a.1 15:15 - 15:30: Anthony Yu: Development of a Sodium LIDAR for Spaceborne Missions
- 9.a.2 15:30 - 15:45: Stephen Mende: The ICON FUV Imager
- 9.a.3 15:45 - 16:00: Iraida Kim: Stokes Parameter Imaging in the Low K-corona
- 9.a.4 16:00 - 16:15: Craig Unick: Selection of FUV Auroral Imagers for Satellite Missions
- 9.a.5 16:15 - 16:30: Marc Lessard: The Fast Auroral Imager (FAI) for the e-POP Mission
- 9.a.6 16:30 - 16:45: Kenneth Dymond: The Tiny Ionospheric Photometers on the COSMIC Constellation
- 9.a.7 16:45 - 17:00: Qian Gong: Mirrorlet Based Integral Field Spectrometer for Solar Eruptions

9.b Particles – Tomorrow’s Instruments [Center]*Chair(s): G. Collinson*

- 9.b.1 15:15 - 15:35: Craig Pollock: The Fast Plasma Investigation on NASA’s Magnetospheric MultiScale Mission: A Case Study in Multi-Instrument Manufacture and Test
- 9.b.2 15:35 - 15:55: Martin Wieser: The SWIM-family of miniature ion mass analyzers
- 9.b.3 15:55 - 16:08: Stas Barabash: Particle Environment Package (PEP) for the ESA JUICE mission
- 9.b.4 16:08 - 16:21 13.0: Joan Stude: The Jovian Plasma Dynamics and Composition Analyzer on JUICE
- 9.b.5 16:21 - 16:34: Benoit Lavraud: AMBRE_NG: A compact dual ion-electron spectrometer for thermal plasma measurements
- 9.b.6 16:34 - 16:47: Robert Michell: APES: Acute Precipitating Electron Spectrometer: A high time-resolution mono-directional electron spectrometer
- 9.b.7 16:47 - 17:00: Dhiren Kataria: Miniaturised *in-situ* particle environment monitor for future space weather missions

9.c Ground – Optical 1 [South]*Chair(s): M. Samara*

- 9.c.1 15:15 - 15:35: Robert Michell: Quantifying spatio-temporal characteristics in auroral structures
- 9.c.2 15:35 - 15:55: Mark Conde : Mapping Thermospheric Air Parcel Transport Trajectories via a Large Scale Ground Based Array of Optical Doppler Spectrometers
- 9.c.3 15:55 - 16:08: Marilia Samara: High time resolution multi-spectral imaging: Mesoscale 2D photometry for auroral precipitation estimates
- 9.c.4 16:08 - 16:21: Donald Hampton: Methods for estimating regional auroral electron energy deposition from ground-based optical measurements.
- 9.c.5 16:21 - 16:34: John Noto: A Novel Fabry-Perot Sensor for Atmospheric Sensing
- 9.c.6 16:34 - 16:47: John Meriwether: Recent applications of the narrow-field Fabry-Perot interferometer to the measurement of polar, mid-latitude, and equatorial thermospheric winds and temperatures
- 9.c.7 16:47 - 17:00: M. J. Taylor: An Advanced Mesospheric Temperature Mapper for Novel Mesospheric Research

17:15 - 19:00: Posters – Particles (§ 21.a), Photons (§ 21.b) [Lobby]*Chair(s): T. Moore, G. Collinson, S. Christe, J. Davila***18:30 - 19:30: Science Instrument Hosted Payload Workshop [Center]**

Wednesday, April 22, 8:30 - 17:00

10 8:30 - 10:15: PLENARY – Fields (#2) [Auditorium]

Chair(s): B. Anderson, R. Pfaff

- 10.1 8:30 - 9:05, Invited: Robert Strangeway: Magnetic Field Measurements on Spinning Spacecraft
- 10.2 9:05 - 9:40, Invited: Stuart Bale: Broadband electric field and waves measurements in the solar wind: The Solar Probe Plus/FIELDS
- 10.3 9:40 - 10:15, Invited: Robert Ergun: Measurement of Three Dimensional Electric Fields in Space

11 10:30 - 12:15: PLENARY – Photons (#2) [Auditorium]

Chair(s): J. Spann

- 11.1 10:30 - 11:22, Invited: Stephen Mende: Observing the magnetosphere through auroral imaging
- 11.2 11:22 - 12:15, Invited: Larry Paxton: UV Measurement Techniques

12 13:15 - 15:00: PARALLEL SESSIONS – Ground, Particles, Fields**12.a Ground – Solar [North]***Chair(s): S. Christe*

- 12.a.1 13:15 - 13:35, **Invited:** Joan Burkepile: What's new at the Mauna Loa Solar Observatory
- 12.a.2 13:35 - 13:55, **Invited:** Steven Tomczyk: A Large Coronagraph for Solar Coronal Magnetic Field Studies
- 12.a.3 13:55 - 14:08: Gelu Nita: Measurement of duration and signal to noise ratio of astronomical transients below the instrumental resolution limit using a Spectral Kurtosis spectrometer
- 12.a.4 14:08 - 14:21: Valeriy Popov: 2D Linear Polarimetry in Prominences
- 12.a.5 14:21 - 14:34: Enrico Landi: Coronal Plasma Diagnostics from COSMO
- 12.a.6 14:34 - 14:54, **Invited:** Kevin Reardon: Fabry-Perot-based imaging spectrographs for solar observations

12.b Particles – Energetic Neutral Atoms [Center]*Chair(s): S. Kanekal*

- 12.b.1 13:15 - 13:35, **Invited:** Stas Barabash: Imaging of Space Plasmas with Energetic Neutral Atoms
- 12.b.2 13:35 - 13:55, **Invited:** Donald Mitchell: Energetic Particle Imaging – the Jovian Energetic Neutrals and Ions imager on JUICE
- 12.b.3 13:55 - 14:08: Martin Wieser: The Jovian Neutrals Analyzer, a energetic neutral atom sensor of the Particle Environment Package for JUICE
- 12.b.4 14:08 - 14:21: Joseph Westlake: High Angular and Energy Resolution Low-Energy Neutral Imager (LENI)
- 12.b.5 14:21 - 14:34: Jason McLain: Low-Energy Energetic Neutral Atom Imagers: MINI-ME (Miniature Imager for Neutral Ionospheric atoms and Magnetospheric Electrons) and MILENA (Miniaturized Imager for Low Energy Neutral Atoms)
- 12.b.6 14:34 - 14:47: Keiichi Ogasawara: Comparison of next-generation solid-state detectors for measuring plasma and energetic particles in space
- 12.b.7 14:47 - 15:00: Mark Wiedenbeck: Recent Advances in the Design of Silicon Detector Telescopes for Energetic Particle Measurements in Space

12.c Fields – DC Electric Fields [South]*Chair(s): H. Laakso, D. Rowland*

- 12.c.1 13:15 - 13:35, **Invited:** Robert Pfaff: Electric Field Double Probe Experiments on Non-Spinning Satellites in Low Earth Orbit
- 12.c.2 13:35 - 13:55, **Invited:** Per-Arne Lindqvist: Spherical double probe electric field measurements on Viking, Freja, Astrid-2, Cluster and MMS
- 12.c.3 13:55 - 14:10: Harri Laakso: Comparison of DC Electric Field Measurement Techniques
- 12.c.4 14:10 - 14:25: Marcin Pilinski: An Evolution of CubeSat Based E-field Instrumentation
- 12.c.5 14:25 - 14:40: Douglas Rowland: A Three-Axis Double-Probe Electric Field Instrument for Small Satellites
- 14:40 - 15:00: Discussion

13 15:15 - 17:00*: PARALLEL SESSIONS – Ground, Particles, Photons* (- 17:30)**13.a Ground – Arrays [North]***Chair(s): P. Erickson*

- 13.a.1 15:15 - 15:35, **Invited:** Anthea Coster: Radio Observation Techniques: GNSS and Ionosondes
- 13.a.2 15:35 - 15:55, **Invited:** Alan Weatherwax: At the Cusp of Discovery: The Evolution and Importance of Ground-based Geospace Arrays
- 13.a.3 15:55 - 16:08: Andrew Gerrard: The Automatic Geophysical Observatory (AGO) Program- Past, Present, and Future
- 13.a.4 16:08 - 16:21: David Milling: The CARISMA Magnetometer Array: status and future plans
- 13.a.5 16:21 - 16:34: Mario Bisi: Observations of Interplanetary Scintillation (IPS) and Faraday Rotation (FR) for Solar-Wind and Space-Weather Studies
- 13.a.6 16:34 - 16:47: Seebany Datta-Barua: A GNSS Receiver Array Instrument for Distributed Sensing of Ionospheric Irregularities
- 13.a.7 16:47 - 17:00: Hyomin Kim: An autonomous adaptive low-power instrument platform (AAL-PIP) for remote high-latitude geospace data collection

13.b Particles – Energetic [Center]*Chair(s): M. Wieser*

- 13.b.1 15:15 - 15:35, **Invited:** Joseph F. Fennell: Energetic Particle Sensors
- 13.b.2 15:35 - 15:55, **Invited:** Shri Kanekal: Inter-calibration of energetic electrons and proton measurements by MagEIS, REPT and RPS instruments on board Van Allen Probes
- 13.b.3 15:55 - 16:08: George Ho: Measurements of Suprathermal Ion in the Heliosphere
- 13.b.4 16:08 - 16:21: Seth Claudepierre: A background correction algorithm for Van Allen Probes MagEIS electron flux measurements
- 13.b.5 16:21 - 16:34: Birgit Ritter: Radiation testing for the Jovian environment: in the laboratory and on a CubeSat
- 13.b.6 16:34 - 16:47: Allison Jaynes: Using pulse heights from the Van Allen Probes' REPT instruments to fit the functional form of the relativistic energy spectrum in the inner magnetosphere
- 13.b.7 16:47 - 17:00: Frederic Allegrini: A comprehensive suprathermal ion sensor suite

13.c Photons – Detectors [South]*Chair(s): L. Glesener*

- 13.c.1 15:15 - 15:45, **Invited:** Nikzad Shouleh: High Performance Solid State Detectors for Low Energy Neutral and Charged Particle Detection
- 13.c.2 15:45 - 16:00: Oswald Siegmund: Advances in Photon Counting Imaging Detectors
- 13.c.3 16:00 - 16:15: Shin-nosuke Ishikawa: Fine-pitch CdTe detector for the hard X-ray imaging and spectroscopy of the Sun with the FOXSI rocket experiment
- 13.c.4 16:15 - 16:30: Lindsay Glesener: Detector requirements for solar hard X-ray measurements
- 13.c.5 16:30 - 16:45: Greg Kopp: Total Solar Irradiance Measurement Techniques Have Improved Radiometric Accuracy
- 13.c.6 16:45 - 17:00: Chhavi Goenka: Tunable Filter Technology in Space Plasma Research
- 13.c.7 17:00 - 17:15: Harald Frey: The Imager for Sprites and Upper Atmospheric Lightning (ISUAL)
- 13.c.8 17:15 - 17:30: Steven Christie: HEXITEC Detectors

17:30 - 19:00 Networking Mixer [\[NCAR Mesa Lab\]](#) – No shuttle

Thursday, April 23, 8:30 - 19:00

14 8:30 - 10:15: PLENARY – Ground (#2) [Auditorium]

Chair(s): E. Zesta

- 14.1 8:30 - 9:15, Invited: Haosheng Lin: Remote Sensing of Solar Magnetic Fields – Methods, Tools, and Future Directions
- 14.2 9:15 - 9:45, Invited: Dale Gary: New Measurement Techniques in Solar Radio Physics
- 14.3 9:45 - 10:15, Invited: Joshua Semeter: Imaging science at visible wavelengths

15 10:30 - 12:15: PLENARY – Particles (#2) [Auditorium]

Chair(s): D. Gershman

- 15.1 10:30 - 11:05, Invited: Eberhard Moebius: Time-of-Flight Mass Spectrometers – From Ions to Neutral Atoms
- 15.2 11:05 - 11:40, Invited: David Knudsen: Fast Core Plasma Diagnostics
- 15.3 11:40 - 12:15, Invited: Miguel Larsen: Diagnosing Winds Aloft

16 13:15 - 15:00: PARALLEL SESSIONS – Photons, Particles, Ground**16.a Photons – Algorithms & Techniques [North]***Chair(s): M. Kirk*

- 16.a.1 13:15 - 13:30: Solomon Stanley: An Observation Simulation System for the GOLD and ICON Missions
- 16.a.2 13:30 - 13:45: Michael Kirk: Software Techniques for Removing Noise from Solar Images
- 16.a.3 13:45 - 14:00: Andrew Stephan: Advances in remote sensing of the daytime ionosphere with EUV airglow
- 16.a.4 14:00 - 14:15: Scott Budzien: Advanced EUV/FUV Techniques for Remotely Sensing the Thermosphere and Ionosphere using SSULI
- 16.a.5 14:15 - 14:30: Richard Schwartz: Image Recovery Using the Diffraction Kernel
- 16.a.6 14:30 - 14:45: Craig DeForest: 3-D Tracking of CMEs and other solar wind features using polarized heliospheric imaging
- 16.a.7 14:45 - 15:00: Veronique Bommier: Milne-Eddington Inversion of Unresolved Structures

16.b Particles – Thermal/Core Plasmas [Center]*Chair(s): G. Clark*

- 16.b.1 13:15 - 13:35, **Invited:** Rod Heelis: Satellite Measurements of Thermal Ion Drifts and Temperature
- 16.b.2 13:35 - 13:55, **Invited:** Aroh Barjatya: Langmuir probes in the ionosphere and mesosphere lower thermosphere
- 16.b.3 13:55 - 14:08: Nikolaos Paschalidis: Advanced gated time of flight mass spectrometers for Small Satellites and Cubesats
- 16.b.4 14:08 - 14:21: Andrew Nicholas: Winds-Ions-Neutral Composition Suite Design and Performance
- 16.b.5 14:21 - 14:34: Russell Stoneback: Updating the Ion Velocity Meter for CubeSats
- 16.b.6 14:34 - 14:47: Ian Cohen: Rocket-borne Measurements of Electron Temperature with the Electron Retarding Potential Analyzer (ERPA) instrument
- 16.b.7 14:47 - 15:00: Jeff Klenzing: The effect of light ions on the collection efficiency of "fixed-bias Langmuir Probes and Ion Traps"

16.c Ground – Radio 2 and Optical 2 [South]*Chair(s): S. Kaeppler*

- 16.c.1 13:15 - 13:35, **Invited:** Diego Janches: Progress in Neutral Dynamics and Meteor Studies Utilizing Advance Design Meteor Radars
- 16.c.2 13:35 - 13:48: Xinzhaoh Chu: Ground-based Optical and Radio Remote Sensing Cluster at Boulder (40°N, 105°W), Colorado for Geospace Observation
- 16.c.3 13:48 - 14:01: Nikolay Zabotin: Dynasonde methods as the future of ionospheric radio sounding
- 16.c.4 14:01 - 14:14: Brian Jackel: Calibration of auroral optical instruments using astronomical sources.
- 16.c.5 14:14 - 14:27: Jayachandran Thayyil: Expanded Canadian-High Arctic Ionospheric Network (ECHAIN)
- 16.c.6 14:17 - 14:40: Irfan Azeem: Geospace and Space Weather Monitoring from Unmanned Marine Vehicles
- 16.c.7 14:40 - 14:53: Hanna Dahlgren: Investigating the electrodynamics and energy characteristics of auroral structures at high resolution by optical methods
- 16.c.8 14:53 - 15:06: Michael Hirsch: High frame-rate tomographic analysis of the aurora

17 15:30 - 17:00: PARALLEL SESSIONS – Photons, Particles, Fields**17.a Photons – Misc [North]***Chair(s): A. Caspi*

- 17.a.1 15:15 - 15:30: Harald Frey: Calibration and testing of wide-field UV instruments
- 17.a.2 15:30 - 15:45: Neerav Shah: Enabling Revolutionary Science with a Virtual Telescope: Formation Flying Technologies and Capabilities
- 17.a.3 15:45 - 16:00: Dong Wu: Development of low-power 2.0 THz heterodyne spectrometer to profile global lower-thermospheric wind, temperature and atomic oxygen density
- 17.a.4 16:00 - 16:15: Luciano Rodriguez: ASPICS, a Giant Solar Coronagraph Onboard the PROBA-3 Mission
- 17.a.5 16:15 - 16:30: Amir Caspi: Enabling Technologies for Solar X-ray Observations from CubeSats
- 17.a.6 16:30 - 16:45: Martin Fivian: Precise Aspect Systems for a Sun-Pointed Spin-Stabilized Spacecraft
- 17.a.7 16:45 - 17:00: Joseph Plowman: The CoMP Instrument and Data Processing

17.b Particles – New Techniques [Center]*Chair(s): N. Paschalidis, M. Hill*

- 17.b.1 15:15 - 15:36, **Invited:** Justin Kasper: Design of a Sun-Facing Plasma Instrument for Solar Probe Plus
- 17.b.2 15:36 - 15:48: Ulrik Gliese: Improved Detection System Description and New Method for Accurate Calibration of Micro-Channel Plate based Instruments and its use in the Fast Plasma Investigation on NASA's Magnetospheric MultiScale Mission
- 17.b.3 15:48 - 16:00: Daniel Gershman: The Parameterization of Top-Hat Particle Sensors with Microchannel-Plate-Based Detection Systems and its Application to the Fast Plasma Investigation on NASA's Magnetospheric MultiScale Mission
- 17.b.4 16:00 - 16:12: Alexander Barrie: Performance of a Discrete Wavelet Transform for Compressing Plasma Count Data and its Application to the Fast Plasma Investigation on NASA's Magnetospheric Multiscale Mission
- 17.b.5 16:12 - 16:24: Mark Popecki: Next Generation Microchannel Plates using Glass Capillary Arrays with Atomic Layer Deposition Films for Resistance and Gain
- 17.b.6 16:24 - 16:36: George Clark: Modeling the response of a top hat electrostatic analyzer in an external magnetic field: Experimental validation with the Juno JADE-E sensor
- 17.b.7 16:36 - 16:48: Ruth Skoug: Wide Field-of-View Plasma Spectrometer
- 17.b.8 16:48 - 17:00: Jörg-Micha Jahn: FPGA-based Time-Of-Flight Determination for Particle Instruments

17.c Fields – Spacecraft Charging [South]*Chair(s): K. Lynch, S. Califf*

- 17.c.1 15:15 - 15:35, **Invited:** Harri Laakso: Space potential measurements with double probe technique
- 17.c.2 15:35 - 15:55, **Invited:** Christopher Cully: Spacecraft-plasma interactions: simulating instrument performance near a charged spacecraft
- 17.c.3 15:55 - 16:10: Sam Califf: Double-probe electric field measurements in the inner magnetosphere from THEMIS: quantifying the effect of variable boom shorting on the electric field estimate
- 17.c.4 16:10 - 16:25: Joseph Minow: Techniques for Measuring Surface Potentials in Space
- 17.c.5 16:25 - 16:45, **Invited:** Kristina Lynch: Observing auroral ionospheric plasma despite sheaths and other observational difficulties
- 17.c.6 16:45 - 17:00: Carl Siefring: Impedance and Langmuir Probe Measurements of Plasma Parameters and Application to Determining Plasma Potential

17:15 - 19:00: Posters – Ground (§ 22.a), Fields (§ 22.a) [Lobby]*Chair(s): E. Zesta, P. Erickson, R. Pfaff, B. Anderson*

Friday, April 24, 8:30 - 17:00

18 8:30 - 10:15: PLENARY – Technology Integration / Future Directions (#1) [Auditorium]

Chair(s): J. Spann

18.1 8:30 - 8:55, Invited: Jim L. Burch: Technology Integration/Future Directions—Perspectives from the Magnetosphere

18.2 8:55 - 9:20, Invited: Rod Heelis: Regional Area Descriptions of Ionospheric and Thermospheric Dynamics

18.3 9:20 - 9:45, Invited: Nathan Schwadron: Interstellar Mapping and Acceleration Probe (IMAP)

9:45 - 10:00: Panel/Audience Discussion

19 10:30 - 12:15: PLENARY – Technology Integration / Future Directions (#2) [Auditorium]

Chair(s): T. Moore

19.1 10:15 - 10:40, Invited: Marc Cheung: Remote Sensing Challenges for Understanding Solar Magnetic Activity

19.2 10:40 - 11:05, Invited: Joseph Davila: Future Directions in Solar Observations

19.3 11:05 - 11:30, Invited: John C. Foster: Global Ground-Based Observations of Geospace and Beyond

11:30 - 11:45: Panel/Audience Discussion & Meeting Wrap-up

20 13:15 - 17:00: Editorial Meeting [Center]

Meeting for the Editorial Board (conveners).

21 POSTERS A: 17:15 - 19:00 – Tuesday, April 21**21.a Particles Posters [Lobby]***Chair(s): T. Moore, G. Collinson*

- 21.a.1 Frederic Allegrini: Thin Carbon Foils: A Critical Subsystem for Plasma, Energetic Particle, and Energetic Neutral Atom Instruments in Space
- 21.a.2 Laiola Andersson: Monitoring The Ionosphere
- 21.a.3 Levon Avanov: Results from Preconditioning of 50 Microchannel Plate Chevron Stacks and Extended Life Test of 2 Stacks for the Dual Electron Spectrometers of the Fast Plasma Investigation on NASA's Magnetospheric MultiScale Mission
- 21.a.4 Richard Balthazor: A plasma spectrometer designed for Low Earth Orbit - design variants and on-orbit results
- 21.a.5 Alexander Barrie: In Flight Calibration of the Magnetospheric Multiscale Mission Fast Plasma Investigation
- 21.a.6 Alexandre Cadu: Grazing incidence time-of-flight mass spectrometer: prototype results and possible improvements.
- 21.a.7 Alexandre Cadu: Space-borne signal processing and data compression for time-of-flight spectra.
- 21.a.8 Alexandros Chasapis: *in situ* observations of electron heating and acceleration within thin current sheets in turbulent reconnection
- 21.a.9 Victoria Coffey: The Dual Ion Spectrometers and their Calibration for the Fast Plasma Investigation on NASA's Magnetospheric MultiScale Mission
- 21.a.10 Glyn Collinson: Developments towards a 5keV imaging plasma spectrometer.
- 21.a.11 Ryan Davidson: Miniaturization of Time-of-Flight Mass Spectrometers for CubeSat Applications
- 21.a.12 Pierre Devoto: IDEE, the energetic electron detector onboard TARANIS
- 21.a.13 Chad Fish: Topside Ionospheric Sounder for CubeSats
- 21.a.14 Ulrik Gliese: The Dual Electron Spectrometers and their Calibration for the Fast Plasma Investigation on NASA's Magnetospheric MultiScale Mission
- 21.a.15 Sarah Jones: A Compact Ion and Neutral Mass Spectrometer for the ExoCube Mission
- 21.a.16 Joseph Kujawski: Small form factor delay line implementation for small top hat plasma analyzers
- 21.a.17 Joseph Kujawski: High Frequency Design Considerations for the Large Detector Number and Small Form Factor Dual Electron Spectrometer of the Fast Plasma Investigation on NASA's Magnetospheric MultiScale Mission
- 21.a.18 Benoit Lavraud: Correcting moments of *in situ* particle distribution functions for spacecraft electrostatic charging
- 21.a.19 Susan Lepri: Detecting negative ions onboard small satellites
- 21.a.20 Nikolaos Paschalidis: Advanced Time of Flight, Position Sensing and Energy Measurement Technologies for Space Instrumentation.
- 21.a.21 Michele Piana: RHESSI data and the use of averaged electron flux images for the quantitative study of acceleration and transport mechanisms in solar flares
- 21.a.22 Amy Rager: Study of Dynamic Micro-Channel Plate Saturation Effects for the Fast Plasma Investigation Dual Electron Spectrometers on NASA's Magnetospheric MultiScale Mission
- 21.a.23 Jean Rubiella Romeo: Usage of the ceramic channeltrons in the extreme environment of the Solar Orbiter mission.
- 21.a.24 John Sample: Thin-window, Low-threshold, Solid State Detectors for Supra Thermal Particles.
- 21.a.25 Lois Sarno-Smith: Explaining the Loss of The High Energy (1-10 eV) Plasmasphere Population seen by the Van Allen Probes
- 21.a.26 Padmashri Suresh: Langmuir Probe Theory for Non-uniform Surface Potential

21 POSTERS B: 17:15 - 19:00 – Tuesday, April 21**21.b Photons Posters [Lobby]***Chair(s): S. Christe, J. Davila*

- 21.b.1 Natalie Foster: Calibration of high resolution silicon X-ray detectors for FOXSI
- 21.b.2 Albert Shih: High-resolution imaging, spectroscopy, and polarimetry of solar gamma rays
- 21.b.3 Juan Camilo Buitrago Casas: Properties of grazing incidence Wolter-I optics for hard-X rays
- 21.b.4 Marc Lessard: A Despun Auroral Imager (DAI) for spinning spacecraft
- 21.b.5 Neil Murphy: A compact Doppler/magnetic solar imager
- 21.b.6 Gordon Hurford: Imaging Techniques for Solar Hard X-rays and Gamma-Rays
- 21.b.7 Seth Wieman: An Optics Free Spectrometer for Solar EUV Measurements: Initial Results and Planned Improvements
- 21.b.8 Derek Gardner: Ha Airglow Temperature Observations using Field-Widened Spatial Heterodyne Spectroscopy
- 21.b.9 Adrian Daw: Calibration of EUNIS 2013
- 21.b.10 Qian Wu: Thermospheric Wind Observation Over Antarctica to Explore the Cusp Heating Effect
- 21.b.11 Irfan Azeem: 2.06 Terahertz Radiometer Design for Thermospheric Wind Sounding
- 21.b.12 Brian Dennis: Diffractive X-ray Optics for Solar Flare Imaging
- 21.b.13 Brian Ramsey: Differential Deposition for Figure Correction in X-Ray Optics
- 21.b.14 William E. McClintock: Global scale Observations of the Limb and Disk: Observing the Earth's Ionosphere-Thermosphere with a Hosted Payload on a Communications Satellite

22 POSTERS A: 17:15 - 19:00 – Thursday, April 23**22.a Ground Posters [Lobby]***Chair(s): E. Zesta, P. Erickson*

- 22.a.1 Andrew Gerrard: Available Assets at the Center for Solar-Terrestrial Research
- 22.a.2 Robert Michell: Combined Radar and optical observations of meteors
- 22.a.3 Xinzhaoh Chu: Very Large-Aperture High-Power (VLAHP) Lidar for Exploring the Interaction of Earth's Atmosphere with Space (OASIS 1.0)
- 22.a.4 Craig Unick: A dedicated H-Beta meridian scanning photometer for proton aurora measurement
- 22.a.5 Alan Marchant: Etalon Imaging of Mid-Thermosphere Winds
- 22.a.6 Qian Wu: High latitude thermospheric wind observations in the Arctic to study the magnetosphere and ionosphere interaction
- 22.a.7 Dadaso Shetti: Observations of Equatorial Plasma Bubble in Indian Sector by Optical and Radio Techniques
- 22.a.8 Nicola M. Schlatter: Interferometric Radar Imaging on Svalbard
- 22.a.9 Philip Erickson: High-resolution sub auroral electric field measurements in the plasma-sphere boundary layer
- 22.a.10 Tim Neilsen: A Radio Frequency Beacon Receiver for Detection of Ionospheric Scintillation
- 22.a.11 David Themens: GPS Differential Receiver Biases in the Polar Cap Region: Investigating the nature of bias variability
- 22.a.12 Nicholas Ssessanga: Regional optimisation of IRI-2012 output (TEC, foF2) using derived GPS-TEC
- 22.a.13 Hichem Mezaoui: Characterization of the Ionospheric Scintillation at High Latitude Using GPS signal
- 22.a.14 Chris Watson: Statistics of GPS TEC Variations in the Polar Cap Ionosphere
- 22.a.15 Stuart Jefferies: Ground-Based Doppler and Magnetic Imaging of the Sun
- 22.a.16 Daniel Whiter: A new optical method to estimate the neutral temperature at 300 km in the auroral zone
- 22.a.17 Binod Adhikari: Geomagnetic signatures recorded on different longitudinal stations during High Intensity, Long duration, Continuous Auroral Activity (HILDCAA)
- 22.a.18 Titus Yuan: The Na lidar observations of mid-latitude Sporadic E layer and Sporadic Na layer in the lower E region over Logan Utah

22 POSTERS B: 17:15 - 19:00 – Thursday, April 23**22.b Fields Posters [Lobby]***Chair(s): R. Pfaff, B. Anderson*

- 22.b.1 Chrystal Moser: Design and Fabrication of a Miniaturized Fluxgate Magnetometer for the SIGMA and other Cubesat Missions
- 22.b.2 Werner Magnes: Magnetometer Front-end ASIC
- 22.b.3 Harri Laakso: Usage of dual fluxgate technique for the removal of strong solar array disturbances and telemetry errors
- 22.b.4 Robert Pfaff: Critical Review of Double Probe Electric Field Experiments Flown on Sounding Rockets
- 22.b.5 Douglas Rowland: Atomic Oxygen-Resistant Coatings for Electric Field Sensors
- 22.b.6 Paul A. Bernhardt: CARINA: A Mission to Demonstrate Global Measurements of Fields and Particles From Low-Drag Satellites Flying Below the F-Region Ionosphere
- 22.b.7 Carl Siefring: High Impedance Measurements of HF Waves in Space Plasmas with Modern Digital Receivers
- 22.b.8 Baptiste Cecconi: Space based low frequency interferometric radioastronomy: the path towards the imaging of the inner heliosphere.
- 22.b.9 David Malaspina: Analog and Digital Signal Processing on the Digital Fields Board for the FIELDS instrument on the Solar Probe Plus Mission
- 22.b.10 Deirdre Wendel: Using Multiple Magnetometer Data in a Tetrahedron Formation to Derive Instantaneous Magnetic Geometries and Velocities in Space
- 22.b.11 Jan Soucek: On-board processing of waveform measurements implemented in the Time Domain Sampler module of Solar Orbiter RPW instrument
- 22.b.12 Micah Dombrowski: An Autonomous Receiver/Digital Signal Processor Applied to Ground-Based and Rocket-Borne Wave Experiments
- 22.b.13 Eftyhia Zesta: Distributed Acquisition for Geomagnetic Research (DAGR) for Small-Sats
- 22.b.14 Robert Marshall: Electric and Magnetic Field Measurements on the VPM CubeSat
- 22.b.15 Shahriar Esmaeili: Extracting Kink-like Modes of Multi-Stranded Loops in The Solar Corona
- 22.b.16 George Hospodarsky: Space Based Search Coil Magnetometers